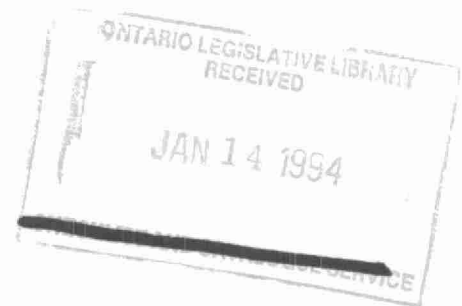


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Old Newspaper Recycling: Status and Outlook

June 1992



Prepared By
Ontario Waste Reduction Office
and
Ontario Printing Paper Users Group



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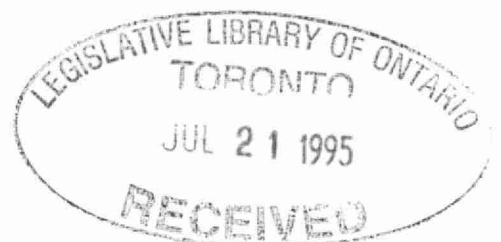
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Old Newspaper Recycling: Status and Outlook

June, 1992

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This report represents joint research by the Waste Reduction Office of the Ministry of the Environment and the Ontario Printing Papers Users Group (OPPUG) to identify the status of ONP recovery and recycling in Ontario and the prospects for increased markets for ONP generated by waste diversion programs.



OLD NEWSPAPER RECYCLING: STATUS AND OUTLOOK

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In 1991, it is estimated that over 50% of ONP was recovered and recycled. This is the highest recycling rate for any material collected through the Blue Box program and will help the province to meet its waste diversion targets of 25% for 1992 and at least 50% or more for 2000. The Ministry is initiating a process through multi-stakeholder consultation to develop a market-oriented strategy to divert a range of paper materials, including newspapers, from disposal to contribute to the achievement of the Ministry's targets for diversion of wastes. Stakeholders include paper producers, newspaper publishers, secondary fibre processors, municipalities, workers and other government agencies. This study demonstrates that at a 50% recovery level, ONP has the highest recycling rate for any post-consumer material, and that this will continue to increase with the increasing demand for ONP from paper mills to produce recycled content paper.

By the end of 1993, four mills in Ontario will be producing recycled content newsprint. Together, these mills will require a supply of 320,000 tonnes of secondary fibre, predominantly ONP which will help to drive higher recovery rates and prices within Ontario. Ontario will soon become a net importer of ONP in the short term in order to meet mill demand for secondary fibre. At current newsprint consumption rates of 480,000 tonnes annually, this would require ONP recovery levels within Ontario in excess of 70%. Recovery rates in the residential sector are currently at about 64% due largely to the success and extensiveness of the Blue Box program. The ICI sector which generates about 30% of ONP wastes is not well serviced; recovered ONP is largely from (pre-consumer) returns and printroom wastes, and some limited recovery through post-consumer programs established by waste contractors, mostly within the GTA. The government's ICI sector mandatory recycling requirements are expected to increase recovery of ONP from this sector, but imports will still be needed to meet demand.

The push to divert ONP from the waste stream by recycling it into new newsprint will have a 'multiplier' effect on the diversion of other papers in the waste stream. The technology used in the mills producing recycled content newsprint also requires use of old magazines (OMG) as a source of fibre and this will put pressure on collection systems to recover magazines. By the end of 1993, most recovered ONP will be recycled back into newsprint. Boxboard producers which are also dependent on ONP as a source of fibre and utilize 43% of recovered ONP), may have to find alternate sources of secondary fibre. This will help drive collection of other papers from all sources.

Ontario publishers are committed to using recycled content newsprint when it is available from their suppliers and undertaking other source reduction measures. The publishers are using recycled content newsprint of varying levels of secondary fibre content depending on what can be provided by their suppliers. Establishment of recycled content requirement levels at this point in time could disadvantage some suppliers, most of which are Ontario and Quebec producers which have suffered large job and financial losses in the past year. Recycled content requirements could also force publishers to import recycled content newsprint from the U.S due to the limited domestic supply. As de-inking facilities come on stream in Ontario and elsewhere in Canada, the total supply of recycled content paper will continue to increase, and will be increase the secondary fibre content levels used by publishers. At the same time,

Executive Summary

publishers are continuing their efforts at other reduction measures such as lightweighting, reduced cutoffs, etc.

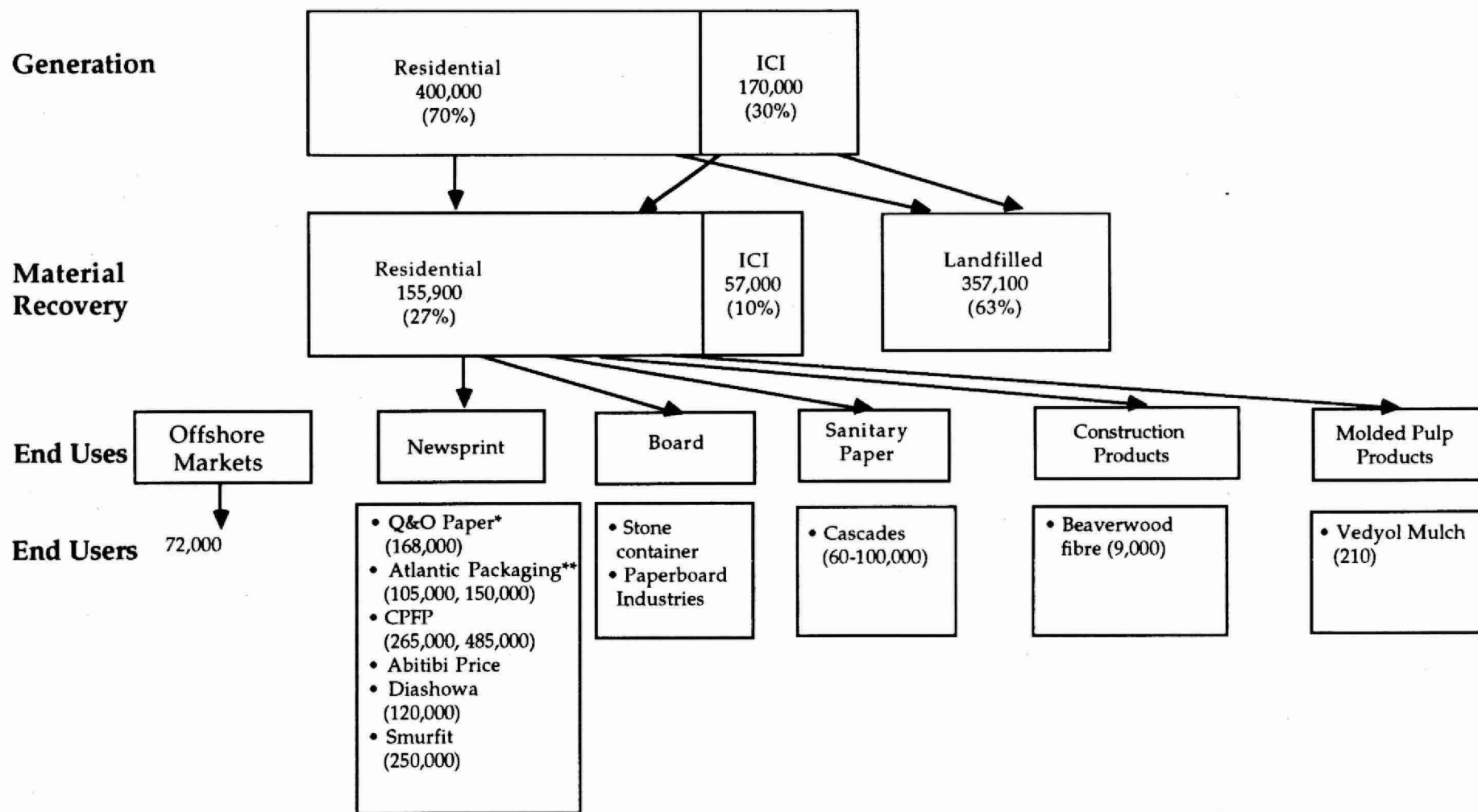
At current projected recycled content production for 1993, Canada will be importing over 750,000 tonnes of ONP. If a high recycled content level e.g. 50%, were set for the Ontario market (which represents about 50% of domestic consumption of newsprint) Canadian paper producers would have to import about 5 million tonnes of ONP and manage the disposal of about 1 million tonnes of sludge. The sludge wastes generated by the four Ontario mills would be about 50,000 tonnes annually. ONP fibre would also displace chips and sawdust by-products from the sawmilling sector and create an additional waste disposal problem.

ONP revenues have historically covered processing costs and contributed to offset the costs of processing other materials. The price outlook for ONP indicates that this trend will continue, although some municipalities will not receive the full market price because they handle low volumes and must deal through paper brokers. The costs of sorting, baling and marketing ONP at efficient operations generally run in the order of \$35-\$40 per tonne. Currently revenues received by municipal operators are low due to an oversupply of ONP in the marketplace. However, as demand increases in 1992 and 1993, prices are expected to rise to about \$50-\$60 per tonne. At these levels, revenues would offset processing costs, but not all of the collection costs. In addition, some smaller municipalities generate lower volumes of ONP and are therefore dependent on brokers as a means of selling ONP, resulting in a lower realized price. Some assistance, (perhaps to develop a market co-operative or to negotiate direct contracts with ONP users or their agents) may be necessary to help increase revenues received by municipal recycling programs.

The costs of curbside recycling programs also vary significantly; some cost variations result from operational inefficiencies. Costs vary according to the degree of curbside sortation, types of vehicles and processing technology and it is difficult to standardize programs to suit all municipalities. Municipalities should be urged to re-examine all aspects of solid waste management, not just the incremental costs of the added Blue Box program.

The recycling loop is being closed to bring supply and demand into balance through the direct investment by paper manufacturing companies, the newspaper publishers and government programs. The Canadian pulp and paper industry has invested \$1.2 billion to provide the capacity to meet demand for recycled content newsprint and utilize the quantities of ONP diverted from the waste stream. The Ontario publishers have pledged \$10 million to establish an effective Blue Box infrastructure to recover ONP. The Ministry has also provided capital and operating cost support for residential collection programs. Together they represent a demonstrable example of how businesses can work in partnership with governments to close the recycling loop on a timely basis and employ 3Rs options which best suit individual needs. The MOE's targets of waste diversion of ONP are being achieved. The issue of costs and revenues will be further addressed through the Ministry's plans for public consultation on the options for financing waste management systems in Ontario.

Figure 1
ONP Use and Recovery
(tonnes per year)
Ontario 1989



* Chicago Tribune

**Various advertisers and newspaper publishers

1.0 Introduction

In Ontario, approximately 10 million tonnes of solid waste are generated annually. 3Rs initiatives - reduction, reuse and recycling, have begun to reduce our dependency upon landfilling as the primary means of management of these wastes. Papers, including old newspapers (ONP), are the specific focus of attention by the Waste Reduction Office (WRO) of the Ontario Ministry of the Environment as it seeks to address market development issues for paper fibres. In this context, the purpose of this paper is to review the current status of newspaper recovery and recycling in Canada and Ontario, and the future outlook for increased diversion of ONP from the waste stream. The paper is specifically intended to assist the Waste Reduction Office (WRO) and the Ontario newspaper publishers to determine what further effort is required to assist in the diversion of old newspapers from the solid waste stream. The experience with ONP recovery and recycling and the roles of the paper industry and publishers (users) provide a model of industry responsibility which have helped to close the recycling loop. Although the ONP diversion issue is focussed on the Ontario situation, the paper industry and newspaper publishing involve national companies and the flow of newsprint and ONP is examined in both the Ontario and Canadian context.

1.1 Background

About 35% of Ontario's solid waste consists of paper and paper packaging and more of these papers could be recovered and recycled. In Canada, about 5.3 million tonnes of papers are consumed annually. Of this, 1.2 million tonnes (23%), is comprised of newsprint. Approximately half of Canada's newsprint is consumed by newspaper publishers in Ontario; in 1991, Ontario consumption of newsprint totalled 480,000 tonnes. This material enters the waste stream as old newspapers (ONP), primarily from the residential sector which is estimated to account for 70% of the consumption of newspapers.

ONP has been collected by several Ontario municipalities since the early 1970s, however, it was not until the initiation of Blue Box programs that significant diversion of ONP was achieved. In 1989, about 37% of ONP was recovered in Ontario as shown in Figure 1. By 1991 with the recovery of approximately 240,000 tonnes of ONP, the diversion rate had risen to about 50%, the highest recycling rate

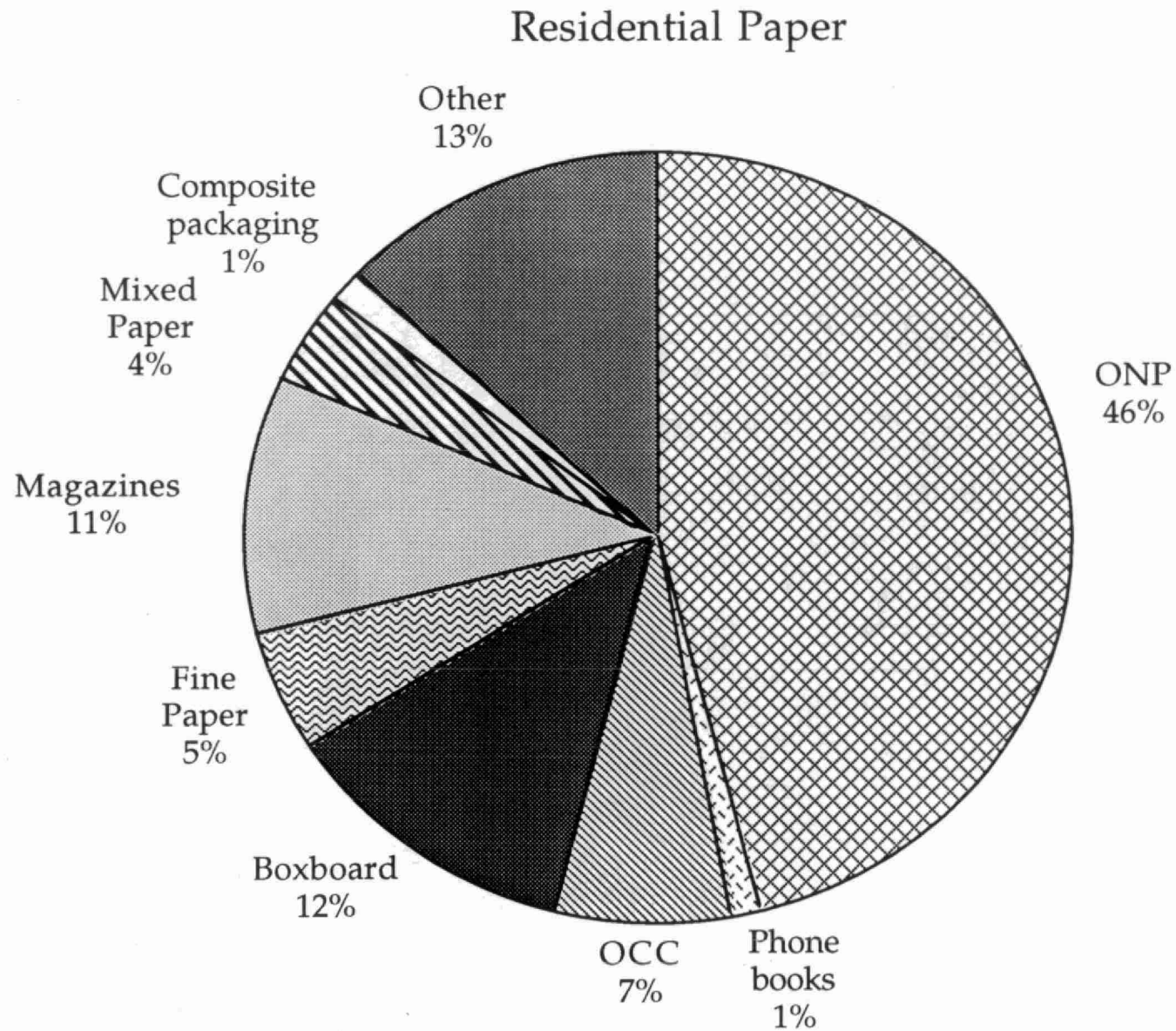
for any post-consumer material. This sharp increase in diversion rates reflects the combined effects of increased recoveries as curbside programs have expanded throughout Ontario, and reduced usage of newsprint by publishers.

As Ontario moves to meet its waste disposal reduction objectives of 25% by the end of 1992 and 50% by 2000 (over 1988 levels), it will become increasingly important to tackle other papers of the waste stream and both residential and ICI (institutional, commercial and industrial) generators, particularly because papers are amenable to recycling, and to a lesser extent to reduction. (Reuse is a small scale means of managing paper waste.)

Recycling of newsprint and other paper materials is not new. Scrap generated in the paper production process has historically been recycled as cuttings, e.g. from newspaper publishers and other printers. ONP is also repulped to make other paper products including linerboard and boxboard which are important markets for ONP. However, recovery of post-consumer papers and paper packaging are becoming increasingly important as municipalities aim to reduce their dependency on landfills for solid waste disposal. Increased demand for recycled content newsprint has stimulated investment of \$1.2 billion within the Canadian pulp and paper sector primarily in de-inking capacity. This investment is both increasing total North American industry capacity to produce newsprint and may displace some virgin fibre, (of which about 50% is sourced as chips and other waste from sawmills). Total demand for newsprint has fallen off during the recession which has reduced prices for newsprint. This has been a benefit to the publishers during a period of weak financial performance, but has exacerbated the fiscal position of the Canadian pulp and paper companies, which collectively lost \$1 billion in 1991.

During the latter part of the 1980s, municipal Blue Box collection programs spread rapidly throughout Ontario and throughout the United States in response to dwindling landfill capacity. By the end of 1991, approximately 70% of Ontario households had curbside collection of recyclables, including ONP, increasing the amount of ONP recovered. However, the paper industry's capacity to utilize ONP has lagged the surge in supply of ONP collected. Excess supply coupled with weak demand has resulted in a drop in prices for ONP and all other materials collected in the Blue Box. It is anticipated that as new recycled content newsprint production capacity comes on stream throughout 1992 and 1993, demand and supply of ONP in

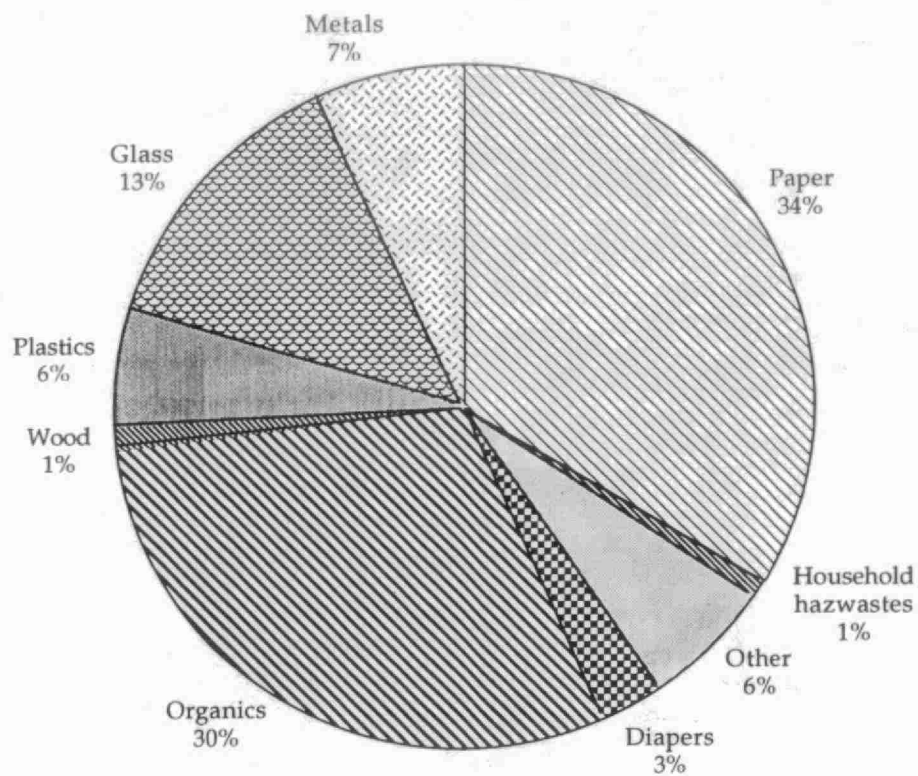
Figure 2: 1989 Ontario Waste Composition



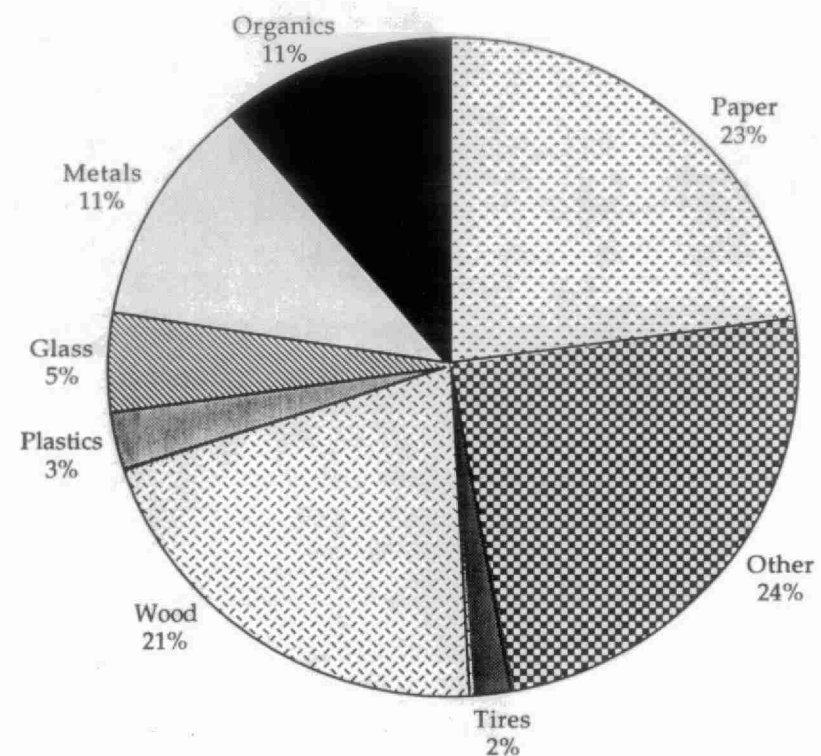
Data derived from CH2M Hill Report, 1991

Figure 3: Waste Composition in the Residential and ICI Sectors

Solid Waste From Residential Sources



1989 Waste Composition from ICI Sources



Ontario will be in balance by the end of 1993. This increase in demand is expected to raise ONP prices from current low levels of \$5-\$10 per tonne to the historical average in the range of \$45-\$50 per tonne. At these levels, revenues will offset processing costs in whole or in part, depending on the collection program, and this will benefit the Blue Box program. Multi-material curbside programs are more labour intensive than regular garbage collection and hence the cost per tonne of collecting and processing recyclables is higher than collection and landfill disposal of garbage. (Tipping fees also play a role in the determining the comparative economics of landfilling vs recycling.) In the current recession, municipalities are seeking ways to increase revenues from recyclables and reduce program costs.

2.0 Paper Waste and WRO Goals for Waste Management

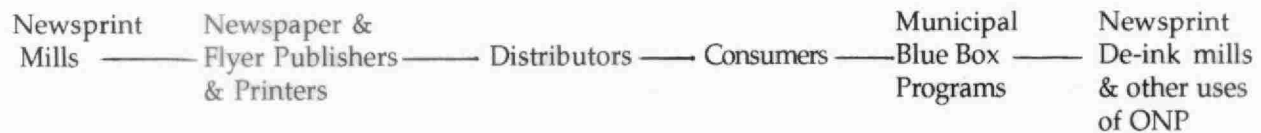
The goal of the WRO is to achieve diversion of wastes from disposal of at least 25% by 1992 and 50% by 2000 using the 3Rs hierarchy of reduction, reuse and recycling. The 3Rs strategy for paper fibres will focus on the development of economically and environmentally sustainable initiatives, particularly markets, which will divert ONP and other papers from the waste stream consistent with the overall waste diversion targets for Ontario. Ontario's current objective is to reduce the total quantity of material going to landfill by 25% by the end of 1992 and by 50% or more by the end of 2000, compared to 1988 levels. (It is not anticipated that each material in the waste stream will be measured against these targets on an individual material basis.) Beyond this, Metro Toronto has proposed that only 10% of the waste stream be landfilled by the year 2030, while the balance be managed through other means.

2.1 Paper in the Solid Waste Stream

Paper and paperboard materials comprise about 29% of the total waste stream (ICI & residential); ONP is approximately 9% of the total waste stream. Paper products represent 34% of the residential waste stream with ONP making up almost half (46%) of the paper waste stream. Figures 2 and 3 detail the 1989 Ontario waste composition from the 1991 study by CH2M Hill.

Meeting the diversion targets will require cooperation among the stakeholders. There are several stakeholders involved in the various stages of production, use and waste management of newsprint. Collectively they represent the participants in the product stewardship chain. A schematic of the chain of product stewardship is shown below.

The Newsprint/ONP Product Stewardship Chain



At issue is their respective roles and responsibilities in closing the recycling loop while maintaining the economic sustainability of this multiplicity of stakeholders. These roles may change in the different stages of production, distribution, consumption, reprocessing and final disposal, and over time. No single stakeholder has complete stewardship responsibility for all stages in the chain.

Product Stewardship is an evolving concept which recognizes that industry is moving in stages toward increasing sharing of responsibility (with consumers and governments) for waste management. Product Stewardship therefore means different responsibilities for the different stakeholders. The ultimate objective is to define the roles and responsibilities so that the links in the product stewardship chain are effectively closed to ensure the diversion and recycling of ONP.

2.2 Stakeholders

The stakeholder groups in the production, use and recycling of ONP involve a variety of people and organizations that benefit from the production or use of newsprint and newspapers including publishers, printers and consumers. The following table identifies the stakeholders that are involved in the newsprint product stewardship chain.

Stakeholders	Role
Forestry Organizations	Management, harvesting & transportation of wood for virgin fibre
Pulp & Paper mills	Producers of newsprint pulp or newsprint paper
Newspaper Publishers	Publishers of daily, weekly newspapers and shoppers paper, users of newsprint
Flyer Printers	Producers of inserts & flyers
Firms using flyer advertising	Retail firms that use flyer advertising for their products
Post Office	distributor of flyers
Private Flyer/Newspaper Delivery Firms	Distributors of flyers, shoppers & newspapers
Consumers residential, office, school. etc	Consumers of newspaper, flyers, generators of ONP
Municipalities	Collectors of ONP in the Blue Box
Private Haulers	Collectors of ONP in the Blue Box
Waste Paper Brokers	Connect buyers & sellers of ONP
Provincial Government	Funding for ONP collection & market development, transition costs, legislation development, environmental protection,
Federal Government	Environmental legislation, retraining, industry support
Industry Associations	Associations - groups representing stakeholders eg. CPPA, OMMRI, CDNA, OFIA

Non-Government
Organizations

Groups representing a variety of
public concerns eg. RCO

2.3 Issues Facing the Stakeholders

The following sets out some of the issues facing the stakeholders which are discussed in subsequent sections of this paper.

Virgin Fibre Paper Producers:

- impact of recycling ONP into newsprint on forestry jobs

Ontario Pulp & Paper Mills:

- impact of declining demand for newsprint
- impact of US recycled content legislation
- source of supply for ONP
- cost of sourcing ONP from urban areas
- loss of market share to US mills
- increased volumes of paper sludge from de-inking

Newspaper Publishers:

- differential recycled content requirements across jurisdictions
- adequacy of supply and quality of recycled content newsprint
- mature market for newspapers

Municipalities:

- cost of collection and processing to be covered by revenues
- need for co-operative marketing by smaller volume municipalities
- security that Ontario mills will use Ontario ONP

Provincial Government:

- need for recycled content legislation in Ontario
- role in market development
- other government support to maintain a viable paper industry in Ontario
- impact of sludge disposal requirements

3.0 Newsprint Production and Usage

This chapter assesses the current level of newsprint production, consumption and ONP utilization by the pulp and paper industry, and examines the industry's capacity to provide a market for Ontario's ONP.

3.1 Current Situation and Outlook for 1993

Newsprint is used to produce a variety of paper products including newspapers, flyers, writing tablets/paper. Over 95% of the newsprint consumed in Canada goes into the printing of newspapers. Currently, forest products are Canada's largest export and the U.S. is our largest consumer of newsprint. However, Canada has increasingly lost market share as U.S. domestic production of newsprint has increased in the past 3 years. This trend is expected to continue as more de-inking capacity comes on stream in the U.S., drawing from their large supply of ONP to make recycled content newsprint.

The paper manufacturing industry plays an important role in the economy of Ontario and the ability to meet provincial and national waste diversion goals through increased recycling. Recycling of recovered paper has been commonplace in the industry for decades. What is new is the use of increasing quantities of post-consumer ONP and other fibres in the process of producing newsprint.

In 1990, there were 9 mills which produced newsprint from recycled fibre in Canada and the U.S. Only one of these mills - Quebec & Ontario Paper - was located in Canada. The others were in regions of the U.S. with access to a large and growing supply of ONP. By the end of 1991, 2 mills in Canada (both of which are in Ontario) could supply newsprint with a significant level of recycled content. Most of their output is committed under long term contracts to publishers throughout Canada and in the U.S. In 1992, two mills - Newstech in B.C. and Cascades in Quebec - are producing de-inked pulp for sale to other paper producers, and several other mills across Canada are testing production of recycled content newsprint without fully de-inking the ONP.

By the end of 1992, six Canadian mills will be capable of producing recycled content newsprint, four of these are located in Ontario. Together their newsprint will

average 48% recycled content, however, the range across these mills is very large - from about 10% to 100%. This represents a modest 8% of total Canadian newsprint production capacity, a rise from 3% in 1990. Based on the industry's total capacity of 10.4 million tonnes, the average recycled content of all Canadian newsprint output was 4% in 1991. This will double in 1992 to 8%, and double again to over 15% in 1993 as new facilities come on stream.

U.S. paper producers have a distinct competitive advantage due to their access to an abundant supply of ONP. Coupled with their production cost advantage, more investment in recycled content capacity is expected to take place in the U.S. Appendix 1 contains a listing of Canadian and U.S. mills producing and expected to produce recycled content newsprint.

While recycled content newsprint is not a "new" product, its widespread use by newspaper publishers is new for the industry. Throughout the 1980s as the paper mills invested in new pulping (e.g. CTMP and TMP and paper machine technologies (e.g. twin wire machines which produce the same quality of printing surface on both sides of the newsprint sheet), the quality of newsprint measured in terms of runability, opacity and brightness has increased significantly. By contrast, recycled content newspaper are generally a slightly lower quality, although this is more pronounced as the recycled content rises above the 60% level. In comparison to the high quality virgin newsprint, high recycled content newsprint does not measure up. At issue is whether this is a result of the recycled content or the newspaper presses which were designed for virgin paper. Some of the problems encountered are still 'bugs' which remain to be worked out of the system. For publishers using high recycled content paper these include increased frequency of web breaks, lint accumulation on machinery, dulling of slitters (due to clay content) and the quality of colour reproduction.

3.2 Sources and Supply of ONP

Old newspaper is generated through the following sources:

- 1) Newspapers purchased, used by consumers in the home or office/commercial establishments,
- 2) newsstand returns from publishers (overissue)

- 3) and pressroom waste from printers.

The first source represents post-consumer waste, sources 2 & 3 are considered pre-consumer (or post-industrial) waste. Post-consumer ONP generated in the residential sector is collected in all Ontario municipal Blue Box systems. Many inserts and flyers are also printed on newsprint and are usually collected together with the newspapers in the Blue Box. Other papers such as calendered and coated stock are also used for inserts. These papers are generally recyclable in the newsprint process, but on the basis of industry standards for secondary paper grades, are considered contaminants in a bale of ONP.

Ontario's newsprint mills will require a supply of 415,000 tonnes of ONP in 1993. An additional 23,000 tonnes of ONP is consumed by mills producing construction materials and boxboard. Total Ontario demand is expected to be in the order of 438,000 tonnes (depending on capacity utilization), distributed among the following mills:

Ontario Paper and Board Mills ONP Demand

Newsprint Mills

Quebec & Ontario Paper	140,000 tonnes
Atlantic	120,000
CPFP (Thunder Bay)	115,000
Spruce Falls	<u>40,000</u>
sub-total	415,000

Board Mills

Beaverwood	9,000
Paperboard Industries	5,000
Sonoco	3,000
Strathcona	<u>6,000</u>
sub-total	<u>23,000</u>
Total ONP Demand	<u>438,000 tonnes</u>

Current recovery of ONP through Blue Box programs reached 200,000 tonnes in 1991, and an additional 40,000 tonnes is estimated to be recovered from other non-residential sources including printroom wastes and returns. On this basis, Ontario could source 55% of its ONP needs domestically based on current collection systems and recovery rates. The balance would have to be imported, primarily from the U.S. Some Ontario mills are presently importing ONP from the U.S. because of a lack of supply in Ontario and due to the price and availability of large quantities from state

collection programs. However, Ontario may be able to increase its recovery of ONP (thus reducing imports) for two reasons.

First, the Ministry of the Environment Initiatives Paper #1 (developed from the Waste Reduction Action Plan) proposes mandatory source separation regulations that are expected to increase the amount of ONP collected by municipalities and within the ICI sector, by expanding the number of collection systems in place. ONP collection and MRF (material recovery) facilities will be under permit by rule if the regulations are adopted. This faster approvals process should indirectly increase in the amount of ONP collected. However, the primary increase in recovery of ONP is expected to occur in the ICI sector which is estimated to account for 30% of all ONP.

Second, newsprint consumption is cyclical and fluctuates with the overall strength of the economy. Total newsprint consumption in Ontario has declined by 30% since 1989, reflecting the combined effects of reduced advertising, smaller newspaper size and a shift to lighter weight newsprint. As newsprint consumption rises with the strengthening of the economy and recovery rates remain at current levels, a higher proportion of ONP could be sourced from Ontario Blue Box programs. Any shortfall of ONP would be met through imports from the U.S. and other provinces.

This shift to ONP as a source of fibre is also expected to have impacts on the use of virgin fibre. Virgin fibre used in the form of roundwood (i.e. logs) as well as chips, which would otherwise be a waste by-product from the sawmilling segment of the forest products industry. Displacement of virgin fibre could potentially reduce the harvest of trees, but may also result in glut of chips which would pose a waste disposal problem for the sawmills and necessitate the development of alternative markets.

3.3 Demand for ONP in Ontario

The largest use of ONP is recycled content newsprint, but other paper products also compete for this source of fibre as shown in the table below:

Products that use ONP in their Production

(Ranked by use of recovered ONP)

1.	44%	Newsprint
2.	43%	Boxboard
3.	7%	Construction board & materials
4.	5%	Molded Pulp Products (eg. egg cartons)
5.	<1%	Tissue products
6.	<1%	Packaging
7.	<1%	Animal bedding

source: H.A. Simons (November 1991)

As newsprint production increases its use of ONP and prices rise, other lower grade products which use ONP such as boxboard, will be forced to seek out other low cost secondary fibres.

3.4 Economics of the Canadian Pulp and Paper Industry

Present North American newsprint capacity is about 20% greater than demand. In 1991, on average, Canadian newsprint mills operated at 87% of capacity, compared to 89% in 1990. (In 1992, Canadian newsprint mills are running at 80% of capacity compared to a 97% rate for U.S. mills.) About 30% of Canadian mill capacity is owned by U.S. companies. This figure may be significant if the U.S. parent companies reduce their Canadian newsprint production to maintain their U.S. mill operating rates.

Some of the strong profits of the Canadian pulp and paper industry in recent years were achieved because of the low value of the Canadian dollar and the cost advantages of Canadian mills. However, when these profit figures are discounted for inflation, in real terms profitability in this sector has been declining. In the pulp and paper industry, it takes approximately 4 - 8 years for planning, budgeting and construction for expanded capacity. Capacity which came into production during 1987-1991, was planned in the early 1980s, before some companies recognized the potential importance of recycling. Most of this investment was therefore based on technologies which utilized virgin fibre. The majority of this investment took

place in western Canada and southern U.S. states. The smallest amount of investment took place in Ontario, Quebec and the maritime provinces.

Comparative costs of newsprint production in Canada and U.S. indicate that Canada has lost its competitive advantage. On average, in 1990, Ontario/Quebec mills required 4 person hours to produce 1 tonne of newsprint; U.S. mills required 2 person hours to produce 1 tonne of newsprint. This difference is due to older, less efficient equipment, smaller capacity paper machines, and generally higher labour rates. Overall, Canadian newsprint production costs are about 12% to 13% higher than those of the U.S.

In Ontario, the majority of newsprint mills use virgin fibre and therefore, are generally located in the north, near the supply of trees. A downturn in the pulp and paper industry can have dramatic economic effects on isolated northern towns with pulp and paper as their primary industry.

A number of paper companies have established a business association with recycling companies or have developed their own waste paper divisions to ensure a long term supply of ONP (eg. CPFP and Laidlaw, Stone Consolidated and WMI, Weyerhaeuser and BFI, Domtar, Q&O Paper, Cascades). Others are purchasing de-inked pulp from other companies. Irving Paper in New Brunswick purchases pulp from a de-inking plant in Maine. The plant recycles Maine's ONP and the arrangement allows Irving to supply its Maine publishers with recycled content newsprint. (New Brunswick has virtually no infrastructure for the collection of ONP.) Another interesting investment trend is the equity ownership in North American newsprint mills by large U.S. newspaper publishers. In some of these arrangements, there are purchasing contracts established between the publishers and the newsprint mills (e.g. The Chicago Tribune and Quebec & Ontario Paper).

3.5 Economics of the Newspaper Publishing Industry

The largest user of newsprint, the newspaper publishing industry, is experiencing a decrease in the demand for their product — newspapers. In the U.S., circulation and

readership has been declining for the past few years. Some of the factors creating this trend include:

- 1) increased competition from other media sources for news
- 2) an aging population,
- 3) less time available for reading,
- 4) more families with both partners working (sharing a newspaper at the office)
- 5) adult illiteracy,

Daily newspaper readership has been declining steadily in the US, particularly due to competition from the electronic news media. As circulation declines, ad lineage falls off. In 1991, 16 U.S. dailies folded. This trend is expected to continue.

In Canada, readership and circulation have softened somewhat, but not as dramatically as in the U.S. In Ontario, no major daily paper ceased publication in 1991, however, most reported weak financial results for the year. These were most pronounced in the Toronto market where ad lineage declines were most significant. For example, Southam reported a 1991 loss of \$153.2 million, compared to a profit of \$2.7 million in 1990. Total revenues declined from \$848.9 million to \$829.8 million in 1990. Torstar reported a loss of \$3.4 million in 1991, compared with a profit of \$46.4 million in the previous year. Lower newsprint prices, which generally account for about 30% of production costs, have been a benefit to the industry. However, as the economy recovers, newsprint prices are expected to increase putting publishers under increased financial pressure.

4.0 Policies and Programs to Stimulate Supply and Demand of ONP

As curbside recycling programs have grown throughout Canada and the U.S., the supply of ONP has risen dramatically. The result was a significant excess of supply relative to domestic demand, and even traditional export markets (the fibre-short Pacific Rim countries) for ONP have been unable to take up the slack. In order to stimulate demand for ONP, some jurisdictions have been establishing recycled fibre content requirements for newsprint used by publishers.

Recycled content requirements are seen as a means to stimulate demand and ultimately to raise prices of ONP to support recycling programs. This section examines how this approach has been used in the U.S. and the impact on Canadian publishers and paper mills, and the effects if adopted in Canada. The evidence indicates that the market for ONP is developing rapidly primarily through mill production of recycled content newsprint to meet publishers' demands even in the absence of recycled content legislation and is coupled with other reduction measures by publishers.

4.1 Demand Policies

4.1.1 United States

States in the U.S. have used 3 mechanisms to encourage publishers to use recycled content newsprint - mandated by law, voluntary agreements and taxes on virgin newsprint. To date, 11 states have legislated recycled content use by publishers of large circulation daily newspapers. An additional 11 states have negotiated voluntary agreements with their publishers to use recycled content newsprint, and only one state, Florida, has chosen to levy a tax on virgin newsprint. In 1992, 12 states defeated recycled content legislation. Both the legislated and voluntary agreements do not require publishers to use recycled content paper if this results in increased cost or operating problems.

Generally, both the legislated and voluntary agreements have modest recycled content levels at this stage, e.g. 10% to 20%, in recognition of the limited supply of recycled content newsprint. They aim to increase recycled fibre content to a level of 30% to 50% by the year 2000, depending upon what is realistically achievable.

4.1.2 Canada

In Canada, only the City of Toronto has adopted a resolution requiring 15% recycled content by July 1993 and 20% by July 1994 on a weighted annual average basis. This provides publishers with the flexibility to use both virgin and different levels of secondary content newsprint. These target levels were established through lengthy discussions with both the publishers and the paper mills on what was practically

achievable. The City will establish a committee to determine if further recycled content regulation is needed after 1994.

The federal government Ecologo program allows newsprint producers to use the logo when they meet defined specifications for recycled content newsprint. To qualify, newsprint must contain over 40% by weight of recycled paper, including a minimum of 25% recycled newspapers (ONP).

4.2 Publishers' Use of Recycled Content Newsprint

Even without these content requirements, most major publishers are purchasing recycled newsprint when possible. In Ontario, all of the publishers of major daily newspapers are using recycled content newsprint to the extent that it is available from the paper mills. They are also sharing this limited supply with their sister publishers in other provinces. Ontario publishers are also competing with publishers in other jurisdictions for this limited supply of newsprint. As a result, the publishers of Toronto's 4 daily newspapers have achieved average levels of recycled fibre content which range from 5% to 31% on the basis of total newsprint consumption.

There is a limited supply of recycled content newsprint available in the market today, although this supply is expected to increase significantly by the end of 1994. Setting recycled content requirements at this time will result in more publishers chasing the same limited supply, much of which would be imported from U.S. mills. While the Toronto publishers (which account for the bulk of newsprint consumption in Ontario) may be able to meet the 15% content in 1993, not all publishers in Ontario would be able to meet these same levels if this standard were adopted provincially.

Setting a high recycled content requirement would also establish a trade barrier in the Ontario market and disadvantage several Ontario mills from selling their output here. The Spruce Falls mill in Kapuskasing is a good example. Its recycled fibre content is only 14%. If content requirements above this level were set Ontario-wide, some publishers would have to purchase their paper from the 8 mills in the US. to meet it. This could potentially incur job losses at Ontario and Quebec paper mills which supply most of the newsprint used in the province.

As shown in section 3.1, the capacity of the industry to produce recycled content newsprint is increasing rapidly, but will still not reach an average level of 20% recycled fibre content until 1994. By 1993, Canada will be a net importer of ONP, requiring about 1.3 million tonnes, well in excess of domestic supply, even if we assume high recovery levels throughout Canada. Ontario alone will need to source 200,000 tonnes of ONP from outside the province to meet demand from newsprint and board mills (assuming a 50% recovery rate and 100% operating capacity.)

In addition, mandated secondary content requirements focus primarily on recycling and do not stimulate some of the other steps that publishers can and have taken to reduce their use of newsprint including purchases of lighter weight paper (generally a 9% reduction), shorter cutoff lengths, and production of fewer copies to reduce the volume of over issues.

The federal government Task Force on Waste Paper and Paperboard has also examined the need for recycled content requirements in papers including newsprint, and has concluded that the use of guidelines provide both the paper and publishing industries with a sufficient level of direction. They have also recognized that markets are developing and that cost-effective diversion of ONP from the waste stream is taking place in some provinces through uses other than recycling into new newsprint, such as animal bedding and fibreboard manufacturing.

4.3 Other Environmental Policies

The federal government in Canada has imposed stringent requirements for the elimination of chlorine bleaching by the pulp and paper sector. Virgin newsprint is not bleached using chlorine, and some peroxide bleaching of ONP is needed to meet brightness requirements of recycled content paper. These effluent requirements are expected to require over \$1 billion in new investment by the Canadian pulp and paper industry, at a time when these companies face another bleak financial year.

In Ontario, EPA (Environmental Protection Act) and MISA (Municipal-Industrial Strategy for Abatement). regulations and certificates of approval apply to effluent, air and sludge treatment facilities in pulp and paper mills. Transportation and use or disposal of sludge also requires a certificate of approval from the Ministry of the

Environment. The Ontario MISA regulations governing effluent concentrations, have not yet been finalized, although pulp and paper companies have requested the Ontario government to follow and not exceed the federal standards.

The government of B.C. is implementing legislation that will effectively prohibit, within 10 years, the use of any forms of chlorine to bleach wood pulp during the pulping process. This legislation will likely necessitate an investment of \$20-\$200 million per mill for bleaching and effluent treatment equipment. In the short term, the B.C. legislation for effluent concentrations of AOX (Absorbable Organic Halogens including dioxin concentrations) and suspended solids, is stricter than the proposed Federal legislation. The B.C. legislation will have greater financial impact on mills that are pulping and bleaching virgin wood fibre and may result in closures of older paper mills. Low or non-bleaching mills, such as some mills using 100% ONP as their furnish or those purchasing virgin pulp and blending it with ONP will not be greatly affected.

4.4 Supply Policies: Collection and Recycling Programs

The spread of recycling programs (the Blue Box) throughout North America has significantly increased the supply of ONP for recycling. Ontario has been a pioneer in the Blue Box program, both in terms of private sector participation and in the levels of participation.

Ontario municipalities, the Ministry of the Environment and *OMMRI: Corporations in Support of Recycling* contribute equally to the initial capital costs of Ontario municipal Blue Box programs. Operating cost support is provided by MOE through its Municipal Recycling Support Program (MRSP). Eligibility for funding for the establishment and operation of a Blue Box/depot program requires the municipality to collect at least three materials with one of which is ONP. This ensures that ONP is collected through the municipal recycling system.

The Ministry's MRSP program was initially to run for 3 years, but has recently been extended to 5 years, in the face of weak markets for secondary materials which threaten to undermine the investment in Blue Box infrastructure.

The MOE Waste Management Branch also offers capital grants through the Industrial Waste Diversion Program to 1) generators of ONP who want to divert their material from disposal and 2) to end users of ONP who want to construct new processing capacity. These grants usually cover 25% of the capital and some advertising costs, and based on previous grants, can be up to a maximum of \$4 million. This program covers grants for all ICI sectors and is the only MOE funding mechanism for waste diversion grants. There are funding programs that may be applicable to ONP recycling technology research and development, available from the MOE Research & Technology Branch.

The newspaper publishers have committed up to \$10 million over a five year period to develop the infrastructure to recover ONP, through their participation in OMMRI: Corporations in Support of Recycling. Ontario is the only jurisdiction in North America which has seen the financial participation of publishers in a collection system, which has historically been the fiscal responsibility of government. The partnership with publishers (and other industry participants in OMMRI) has fast-tracked the development of the most comprehensive recycling system in North America. This infrastructure is now nearly complete, with about 80% of Ontario households having access to multi-material municipal recycling programs. The result has been that post-consumer ONP recovery has reached over 50%, and the Blue Box has been instrumental in achieving these levels.

Reduction initiatives by Ontario newspaper publishers have reduced the amount of newsprint consumed and ultimately the amount of ONP available for recovery. Economic recovery may increase the amount of advertising and have the effect of increasing the use of newsprint as the economy strengthens.

4.5 Supply/Demand Trends

4.5.1 Demand:

The key factors that effect demand for ONP are 1) the cost of virgin pulp and 2) demand for newsprint with recycled content stimulated by threatened or implemented recycled content legislation.

One of the factors affecting the cost of virgin pulp is the stumpage fee charged for cutting virgin timber on Crown land. Growth of the Canadian economy has been based on the utilization of natural resources. Low stumpage fees are considered as a factor which puts secondary materials at a price disadvantage relative to virgin wood fibre. The province of Ontario recently established the Fair Tax Commission to examine the issues of eight different tax systems, including "The Environment and Taxes" and this issue may be addressed by the Commission.

At today's low prices for ONP, there is a cost advantage to paper mills in using secondary fibre over virgin pulp. Burns Fry Investment (Investment Report, February 1990) estimated that at \$0 per tonne for ONP from municipal programs, that the cash cost of one tonne of de-inked fibre was \$183 compared to \$250 for virgin fibre. This cost advantage rapidly disappears as the price of ONP rises. However, the paper companies have a large investment in their woodland operations and virgin pulping capacity, with high fixed costs. Given this and the continued need for virgin fibre in paper, there is limited flexibility to switch production from virgin to secondary fibre.

4.5.2 Supply

The factors effecting the supply and the price of ONP include 1) the consumption of newspapers, 2) the size, efficiency and participation in Blue Box type collection system, 3) mandatory source separation legislation 4) the number of paper and paperboard mills that are competing for the available supply of ONP and 5) the cost of transporting ONP to newsprint mills.

From 1988 through 1990, there was a market glut of ONP because of increasing supply from active municipal collection programs and low demand as the paper mills were only in the initial stages of planning and constructing de-inking facilities. This market situation caused the price of ONP to collapse to the point where some programs paid to have the ONP taken away. This glut was worsened by the strike at Quebec & Ontario Paper -- the only established outlet for Ontario ONP. The strike forced municipalities to examine other markets such as overseas export and review their collection programs. The new mill openings and announcements for additional de-inking mill capacity are expected to increase the demand for ONP and eventually the price. Markets for ONP tend to be regional because of the cost of

transport. Thus, that in some parts of North America, there will be a shortage of available ONP, as is expected in Ontario by 1994.

Several different forecasts for the future newsprint consumption rates have been proposed by consultants. The future newsprint consumption will be based on the future demand for newspapers and the most likely scenario suggests flat or very slowly increasing demand.

The investment in recovery infrastructure and level of consumer participation will ultimately determine the amount of ONP recovered. Ontario has already achieved a 50% recovery rate for ONP which is consistent with the province's overall waste diversion goal for the year 2000. Moreover, recovery rates of ONP are expected to increase somewhat through the expansion of Ontario collection programs by 1) educating the generators to increase participation 2) expanding the collection to multi-unit dwellings 3) expanding the collection to ICI generators. From Ontario Blue Box experience in 1990/91, the average consumption per household of newspapers was 140 kg (135 kg/household/year. in U.S..) and the average recovery of ONP per household was about 75 kg (MRSP data). The present recovery rate in Ontario is 50% of available supply, which could increase to 60% to 70% based on ICI recovery programs. In Canada overall, the recovery rate of ONP in 1990 was 26% and in the U.S.A. it was 41%.

Based on the demand by Ontario newsprint and board mills for ONP, these mills will have sufficient capacity to utilize all ONP recovered in the province, and may be a net importer of about 200,000 tonnes of ONP.

4.6 Price Outlook for ONP

During the mid-1980s, ONP price were generally stable in the range of \$40-\$50 per ton. Recently, Ontario prices for ONP have been very low \$0-\$30/tonne over the past 1-2 years due mainly to low demand. Low prices for all recyclables collected through curbside programs has been a source of financial difficulty for many municipalities. However, for ONP, the price outlook is expected to improve. As planned new de-inking capacity comes on-line, there will be an increase in the demand for ONP and it is likely the price will increase as competition for the limited supply rises. A recent forecast suggests ONP prices will reach \$60 per ton

during 1993, and this will stimulate increased recovery rates. Smaller Ontario municipalities without significant volumes of ONP, are also at a price disadvantage as de-inking mills will not buy small quantities of ONP directly and these municipalities sell their old news through brokers thus receiving a reduced price due to the broker's margin. Co-operative marketing may be a means of addressing this price issue for these municipalities.

The use of ONP in the manufacture of paperboard was established due to the positive economics of using waste paper instead of virgin pulp. It is likely that as the price for ONP increases beyond \$60/ton (the price level when boxboard manufacturers began using ONP), this industry will examine the possibility of substituting other waste paper types (fine paper, boxboard) for ONP in their operations.

4.7 Municipal Blue Box Costs for ONP

Ontario municipal Blue Box collection systems are operated by either the municipality, a cooperative organization or a private collection companies. Most de-inking mills accept their ONP bailed; therefore, municipalities without access to these facilities, may be at a disadvantage.

The costs to a municipality for their collection and processing program for recyclables is heavily dependent on the type of system they operate. Municipal programs can vary from using their own packer or compartmentalized trucks, contracting the collection and or processing, using their own MRF or contracting the sorting and processing to a private company. The costs of running a program will also vary depending on the efficiency of the workers and wage rates.

Selective information on recycling program costs was obtained from several municipal Blue Box programs. Depending on the collection system, collection costs for ONP ranged from \$45 to \$115 per tonne. Processing costs show a similar variability. For example, Metro Toronto's costs are in the order of \$195 per tonne because of the multi-material system. However, an examination of processing costs only related to the sorting and baling of ONP, suggests that processing costs for ONP are in the range of \$35 to \$45 per tonne. If revenue forecasts, cost savings from other waste management system changes (e.g. the City of Etobicoke saved over \$1 million

by moving to a once per week collection schedule for regular garbage) and avoided landfill disposal costs (the latter being \$150/tonne in Metro) are taken into account., the costs of processing ONP are more than covered. (The avoided cost of landfill can have a significant impact on this equation, and the relative economics change as landfill tip fees decline.)

Because about 90% of Canadian newsprint is exported to U.S. and international markets, there may be ONP supply problems as there will be a limited amount of recoverable ONP in Canada. It is likely that Canadian users of ONP will have to recovery other supplies of ONP from nearby U.S. states.

4.8 Other Environmental Impacts

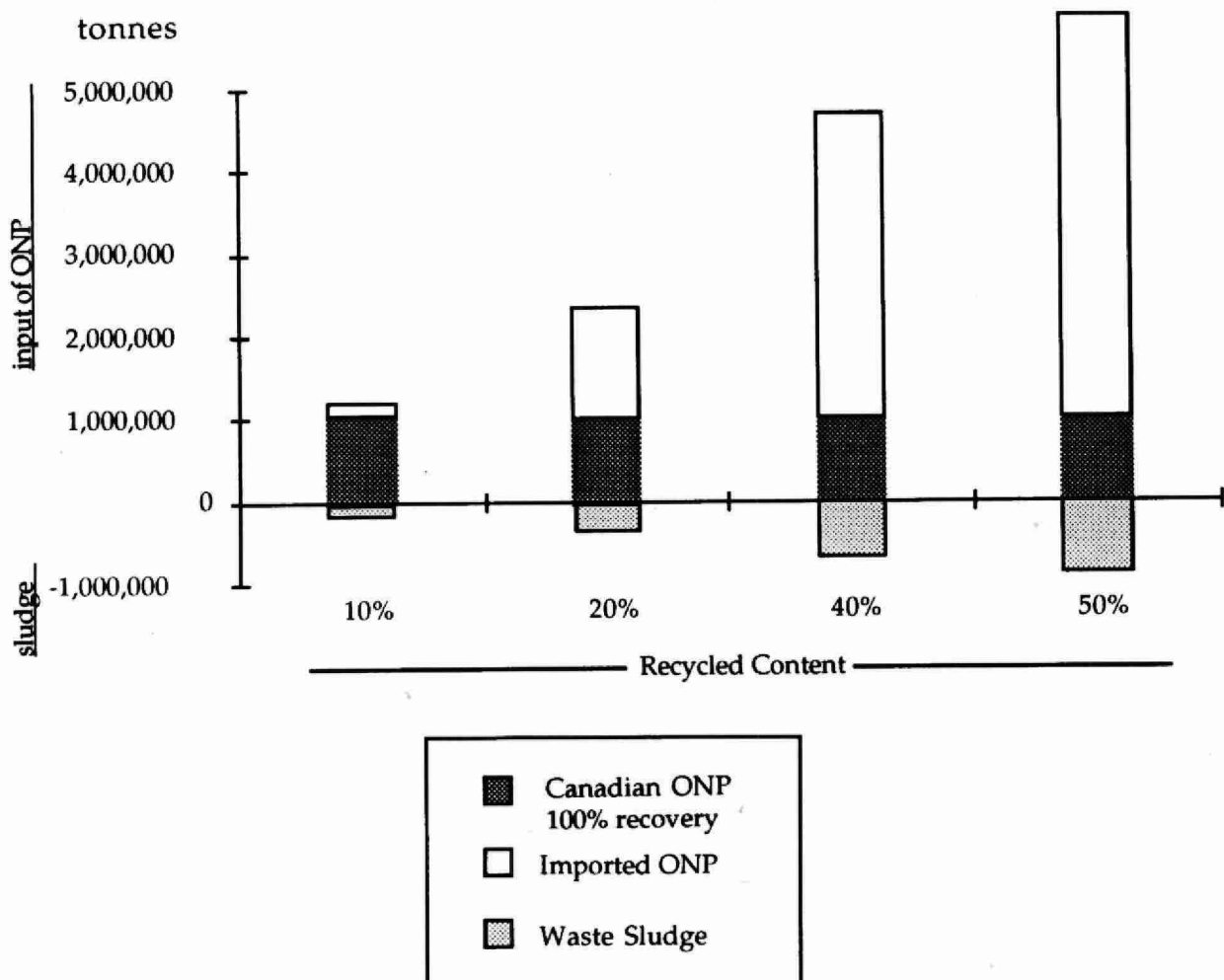
Flotation is the most common de-inking technology in use and it relies upon using both ONP and old magazines (OMG) in roughly a 70:30 ratio. Therefore, the demand for OMG is expected to increase with the increasing demand for ONP for de-inking. Because OMG is a different material with a different market structure, it has not been addressed in this report. However, demand for OMG will stimulate it addition to recovery programs and divert this paper from the waste stream

Use of ONP to make newsprint changes the profile of environmental impacts associated with newsprint production. Repulping ONP saves both energy, water and processing chemicals, however, it generates additional sludge wastes which must be managed or disposed of.

During recycling, approximately 15-20% of the fibre is lost as sludge; this sludge consists of organic paper fibre, inks, other industrial organic compounds and small quantities of metals. It may also contain nitrogen in organic nitrate or ammonium form, which have direct benefits if the sludge is used as a soil enhancer. Presently, the sludge produced at Ontario mills is landfilled, incinerated, applied to agricultural land or composted and then sold as a residential soil conditioner. The Ontario government has drafted interim guidelines for the application of waste organic materials on land and has also established interim standards for dioxin/furan concentrations in the sludge.

Figure 4 shows the potential for generation of sludges for disposal as recycled content fibre increases. If all Canadian newsprint contained 20% ONP, and assuming that all newsprint consumed in Canada were recovered, Canada would still import about 1.4 million tonnes of ONP, and generate roughly 350,000 tonnes of sludge wastes. (These numbers rise to over 5 million tonnes of imported ONP and over 1 million tonnes of sludge wastes if the recycled content increases to 50%.) When all Ontario mills using ONP are in full production, it is estimated that they will generate about 66,000 tonnes of sludge for waste management.

Figure 4
Recycled Content, ONP Usage and Waste Generation



5.0 Closing the Recycling Loop: What's been done and the next steps

Three key stakeholders in the newsprint recycling loop - the newspaper publishers, the newsprint producers and governments - have acted to help close the recycling loop. The newsprint manufacturing companies have invested \$1.2 billion for de-ink facilities and other capital to produce recycled content newsprint. By 1993, over 15% of Canadian capacity will be capable of producing recycled content newsprint. Indeed, actual production could be higher as some Canadian paper mills are expected to purchase de-inked pulp and these figures are not included.

However, most of the investment in recycled content production capacity is being made in the U.S. in locations close to the supply of ONP, *'the urban forest'*. On a North American basis, about 34% of total industry capacity will be capable of producing recycled content newsprint. While Canadian mills will be producing an overall lower recycled content, they will still be a net importer of ONP, even with aggressive domestic collection programs.

Ontario's supply of ONP will be more closely aligned with in-province demand, than that of Canada as a whole. Ontario's paper and board mills will require a supply of 438,000 tonnes of ONP in 1993. Current recovery of ONP through Blue Box programs reached 200,000 tonnes in 1991, and an additional 40,000 tonnes is estimated to be recovered from other non-residential sources including printroom wastes and returns. On this basis, Ontario could source 55% of its ONP needs domestically.

The newspaper publishers' funding commitment through OMMRI: Corporations in Support of Recycling is specifically directed to finance the development of the infrastructure to recover ONP (and other materials). As prices for ONP recover to historical levels in the order of \$40 to \$50 per ton, or to even higher levels, the revenues generated will offset the average processing costs and will help to offset the overall costs of recycling programs. However, some smaller municipalities collecting small quantities of ONP do not receive these higher prices. Co-operative marketing may be one means of improving their market power and increasing revenues received.

The publishers are also fully committed to using recycled content newsprint to create demand for Canadian paper mills. In addition, they are taking steps to reduce their usage of newsprint through lightweighting, shorter cutoff lengths, newspaper format, and other means.

The net result will be an overall reduction in total newsprint consumption. These initiatives coupled with the economic recession have caused a 31% decline in newsprint consumption since 1989. The significant increase in recycled content newsprint production throughout North America will enable producers to meet demand for secondary fibre newsprint throughout North America, raising prices for ONP and generating revenues for municipal recycling programs. By the end of 1993, it is expected that supply and demand for ONP in Ontario will be more in balance, with supply overtaking demand and effectively closing the recycling loop through the investments by publishers, the pulp and paper industry and municipal and provincial governments.

Stabilization of markets should be able to sustain the system on a revenue basis in the near future, although there remains some concern about supporting the system until the point of market sustainability is achieved. The Ministry is developing policy discussion papers on the question of who pays for waste management which are expected to be issued in the Fall of 1992, and the issue of costs and revenues for recycling programs and systems will be addressed in further detail at that stage.

Status of North American Mills' Use of ONP

Table 3-4
North American Recycled-Content Newsprint
Current Operations and Design/Construction Mills
('000 mtpy)

Company	Location	ST Prov	Virgin Capacity	Recycled Start Capacity
CURRENT MILLS				
FSC Paper	Alsip	IL		120 1989
Manistique Papers	Manistique	MI		45 1989
Garden State Paper	Garfield	NJ		200 1989
Stone Container	Snowflake	AZ		265 1989
Atlantic Packaging	Whitby	ON		134 1991
Quebec & Ontario	Thorold	ON		310 1989
Golden State	Pomona	CA		122 1989
North Pacific Paper Co.	Longview	WA	-470	470 1991
Smurfit Newsprint	Oregon City	OR		215 1989
Smurfit Newsprint	Newburg	OR		350 1989
Augusta Newsprint	Augusta	GA	-225	225 1991
Southeast Paper	Dublin	GA		190 1989
Totals			-695	2,861
Company	Location	ST Prov	Virgin Capacity	Recycled Start Capacity
DESIGN/CONSTRUCTION PHASE MILLS				
Alabama River	Claiborne	AL	-218	218 1992
Bowater	Calhoun	TN	-238	238 1992
CPFP	Thunder Bay	ON	-245	245 1992
Spruce Falls	Kapuskasing	ON	-314	314 1992
Inland Empire Paper	Millwood	WA	-73	73 1992
CPFP	Gatineau	PQ	-481	481 1992
Kruger Inc.	Bromptonville	PQ	-125	125 1992
Fletcher Challenge	Crofton	BC	-150	150 1992
MacMillan Bloedel Ltd.	Powell River	BC	-150	150 1992
Totals			-1,994	1,994

Source: SSD, CPPA, API

Table 3-5
North American Recycled-Content Newsprint
Definite Status Mills
('000 mtpy)

Company	Location	ST Prov	Virgin Capacity	Recycled Start Capacity	
DEFINITE STATUS MILLS					
Smurfit Newsprint	Central NY	NY		250	1995
Boise Cascade Corp.	West Tacoma	WA	-178	278	1992
Daishowa	Quebec City	PQ	-275	275	1992
Donohue Inc.	Clermont	PQ	-106	106	1995
James Maclaren	Buckingham	PQ	-106	106	1995
Stone-Consolidated	Shawinigan	PQ	-178	178	1993
Champion International	Sheldon	TX	-325	325	1995
Totals			-843	1518	

Source: SSD, CPPA, API

Table 3-6
North American Recycled-Content Newsprint
Probable Status Mills
('000 mtpy)

Company	Location	ST	Virgin Capacity	Recycled Start Capacity	
PROBABLE / ANNOUNCED PROJECTS					
Bowater/GNN	E. Millinock	ME	-200	200	1993
Ponderosa	New York	NY		190	1993
Golden State	Pomona	CA		230	1995
Domtar Inc.	Dolbeau	PQ	-150	150	1995
Soucy, F.F., Inc.	R. du Loup	PQ	-160	160	1995
Orford Recycling	Drummondvill	PQ	-300	300	1993
Bear Island Paper	Ashland	VA	-109	309	1992
MacBlo/Haindl	Sacramento	CA		258	1995
Evergreen	Redrock	AZ		230	1994
Totals			-919	2,027	

Source: SSD, CPPA, API



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